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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,116	04/19/2002	Lutz Fabian	EF377397961US	1556

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EXAMINER	
DUONG, THANH P	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/018,116	FABIAN ET AL.	
	Examiner	Art Unit	
	Tom P. Duong	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/8/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 20 and 22-23 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Barton et al. (4,644,877). Regarding claim 20, Barton discloses a waste gas cleaning system for removing harmful and/or toxic gases from a gas stream (Fig. 1), comprising: a reaction chamber (14) having an inlet (60) for receiving a gas stream to be treated and an outlet (90); a plasma source (12) coupled to said reaction chamber (14) for providing excitation energy (Col. 3 lines 20-26) to said chamber and form a plasma therein; and a liquid jet (94) arranged at said reaction chamber outlet and generating negative pressure (Col. 6, lines 31-37) in said reaction chamber (14). It appears that the liquid jet (94) of Barton is arranged to draw treated gases out of said reaction chamber mixed with liquid from said liquid jet being the fact that the variable pumps (104, 112) supply the quench water and alkaline solution at a high pressure of 150 psi (Col. 5, lines 15-60) in order to push the mixed liquid and treated gas out of the reaction chamber. In addition, it would have been prima facie obviousness that the suction of the induction fan 20 creates a negative

pressure on the scrubber and the reaction chamber (Col. 6, lines 31-36), which imposes a negative pressure on the liquid jet. Regarding claim 22, Barton discloses the reaction vessel 14 is maintained at atmospheric to slightly negative pressure in the system. Regarding claim 23, Barton discloses the liquid jet pump (114) is provided with a sorption medium (110).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 20-31 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton '877 in view of Carr et al. (5,011, 520). Regarding claims 20-21, Barton discloses a waste gas cleaning system for removing harmful and/or toxic gases from a gas stream (Fig. 1), comprising: a reaction chamber (14) having an inlet (60) for receiving a gas stream to be treated and an outlet (90); a plasma source (12) coupled to said reaction chamber (14) for providing excitation energy (Col. 3 lines 20-26) to said chamber and form a plasma therein; and a liquid jet (94) arranged at said reaction chamber outlet and generating negative pressure (Col. 6, lines 31-37) in said reaction chamber (14). It appears that the liquid jet (94) of Barton is arranged to draw treated gases out of said reaction chamber mixed with liquid from said liquid jet being

the fact that the variable pumps (104, 112) supply the quench water and alkaline solution at a high pressure of 150 psi (Col. 5, lines 15-60) in order to push the mixed liquid and treated gas out of the reaction chamber. In addition, it would have been prima facie obviousness that the suction of the induction fan 20 creates a negative pressure on the scrubber and the reaction chamber (Col. 6, lines 31-36), which imposes a negative pressure on the liquid jet. Likewise, Carr makes it clear that the nozzle fitting 91 is smaller than the scrubbing liquid supply line fitting 91 and such configuration increases the recirculation stream velocity to promote mixing of the incoming gaseous effluent with the scrubbing liquid (Col. 3, lines 65-68 and Col. 4, lines 1-2) and maintain a negative pressure in the scrubber system (Col. 9, lines 1-25). Thus, it would have been obvious in view of Carr to one having ordinary skill in the art to modify the liquid jet of Barton with a liquid jet with a larger cross-sectional area than the outlet to promote intermixing between the gas and scrubbing liquid and maintain a negative pressure in the scrubber system. Regarding claim 22, the above-applied references fail to disclose the specific negative pressure range of the claimed invention, however, it would have been *prima facie* obviousness to optimize the scrubbing system to obtain such negative pressure thru routine experimentation. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Regarding claim 23, Barton discloses the liquid jet pump (114) is provided with a sorption medium (110). Regarding claims 24-26 and 37, Barton fails to disclose a recirculating system including said liquid jet for said sorption medium. Carr teaches a recirculation tank 218 with coolant coils (Col. 13, lines 35-38) and control panel 224 to control the recirculation flow rate (Col. 13, lines 45-52) and a reservoir

having neutralized agent (Col. 13, lines 52-54) to prevent build up in the system and further facilitating self-cleaning of the gas in the scrubber (Col. 4, lines 34-41). Thus, it would have been obvious in view of Carr to one having ordinary skill in the art to modify the scrubbing system of Barton with a recirculation system as taught by Carr in order to control the build up in the system and facilitating self-cleaning of the gas scrubber. Regarding claim 27, it is conventional to provide a circulation pump with a compressed air-driven diaphragm pump in the scrubbing system and it would have been obvious to do so here due to its low maintenance and reliability. Regarding claim 28, Barton discloses a secondary air inlet (via line 44) which contributes to the negative pressure in the reaction chamber. Regarding claim 29, Barton discloses an additional gas (via line 70) to the reaction burner 12 to facilitate the combustion process. Regarding claims 30-31, it is conventional to provide additional gas such as hydrogen, oxygen, and water vapor the reaction chamber and it would have been obvious to do so here to facilitate the oxidation and/or decomposition process. Regarding claim 36, Barton discloses the output of the pump 112 is control by a pH sensor and control is connected to the metering pump to provide alkaline material to the quench water (Col. 5, lines 46-63). Regarding claim 38, Barton discloses the suction line includes at least one aerosol filter (24).

3. Claims 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applied references (Barton '877 in view of Carr et al. '520) and further in view of Wofford et al. (5,750,823). The applied references fail to disclose a non-thermal plasma

source with excitation energy in the microwave range of the claimed invention. Wofford teaches the waste gas is exposed in a non-thermal plasma (Abstract) with microwave energy (Col. 3, lines 5-10) having the microwave range (Col. 5, lines 1-10) of the claimed invention and the use of a non-thermal plasma provide the advantages of reduced energy consumption and more easily removed by-products (Col. 1, lines 4-67 and Col. 2 lines 1-15). Thus, it would have been obvious in view of Wofford to one having ordinary skill in the art to modify the apparatus of the applied references with a non-thermal plasma source as taught by Wofford in order to gain the above advantages.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P. Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Duong
April 2, 2005
TD

Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700